WHAT IS CLAIMED IS:

1. A modulation frequency tunable optical oscillator, comprising:

a wavelength combiner for receiving a pumping light beam having a predetermined wavelength;

a loop mirror connected to one side of the wavelength combiner;

an amplifying optical fiber connected to the other side of the wavelength combiner;

a coupler connected to the amplifying optical fiber for an output light beam; and

a pair of optical fiber grating mirrors connected to the coupler, wherein a light beam outputted from the amplifying optical fiber is reflected in the loop mirror with a different reflectance depending on each wavelength, passes through the amplifying optical fiber, and then is inputted to the optical fiber grating mirrors, whereby the optical fiber grating mirrors constitute a dual laser mode resonator in such a way that the light beams having different wavelength bands are reflected in the optical fiber grating mirrors, respectively.

2. The modulation frequency tunable optical oscillator according to claim 1, wherein the wavelength combiner and the loop mirror are connected through a 50% coupler.

3. The modulation frequency tunable optical oscillator according to claim 1, wherein the loop mirror comprises a distributed compensation optical fiber and a polarization controller.

4. The modulation frequency tunable optical oscillator according to claim 1, wherein the coupler is a 10% coupler.

5. The modulation frequency tunable optical oscillator according to claim 1, wherein a pair of optical fiber grating mirrors include a wavelength fixed optical fiber grating mirror and a wavelength tunable optical fiber grating mirror.

6. The modulation frequency tunable optical oscillator according to claim 1, wherein a pair of optical fiber grating mirrors are arranged in a serial manner.